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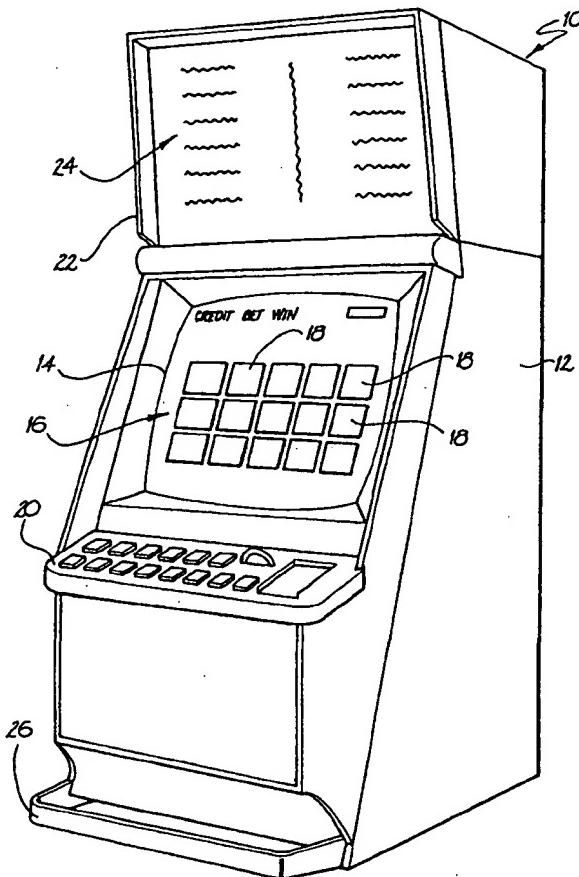
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(54) Title: **A GAMING MACHINE WITH IMPROVED DISPLAY MEANS**



(57) Abstract: A gaming machine includes a display including a plurality of discrete display positions at each of which at least one symbol is to be displayed. A controller controls operation of the display of symbols in the display positions of the display. The display positions are arranged in a matrix having m rows and n columns, where m is greater than 1 and m does not equal n to provide for m length award lines and n length award lines. A symbol occurring at one display position in the matrix is independent of, and unassociated with, the occurrence of symbols at any other display position in the matrix.

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*A gaming machine with improved display means***Field of the Invention**

The present invention relates to a gaming machine of the type known as a slot machine or fruit machine. More particularly, the invention relates 5 to a gaming machine having an improved display means.

Background to the Invention

Players repeatedly playing gaming machines quickly tire of particular games. Therefore, it is necessary for manufacturers of these machines to 10 develop inventive game features which add interest to the games provided on such machines in order to keep the players entertained and willing to continue to play the games.

Gaming machines of the type described are particularly well-known nationally and internationally and substantial amounts of money are wagered 15 on these machines. In the state of New South Wales of Australia, there is a growing tendency to legalise the use of these machines by licensing operators with resultant revenue gains being achieved through licence fees and the taxation of monies invested. The licensed operation of gaming machines is the subject of legislation and regulation. Amongst the items regulated is the 20 maximum percentage payout for a gaming machine. For example, in New South Wales, Australia, a minimum of 85% of monies invested must be returned as winnings and manufacturers of gaming machines must therefore design their machines around these regulatory controls.

With the growth that has occurred in the gaming machine market, 25 there is intense competition between manufacturers to supply the various existing and new venues. When selecting a supplier of gaming machines, the operator of a venue must pay close attention to the popularity of various games with their patrons. Therefore, gaming machine manufacturers are keen to devise games that are popular with players as a mechanism for 30 improving sales and for maintaining player interest. In this regard, various strategies have been tried in the past to make games more enticing to players including an increase in the number of physical reels or video simulations of such reels. It has become almost standard practice for a gaming machine to have five spinning reels or video simulations thereof.

By altering the display of a gaming machine of the type in question, various additional combinations can be provided which should maintain player interest for longer, entice new players and allow the introduction of new features.

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Summary of the Invention

According to a first aspect of the invention, there is provided a gaming machine which includes:

- 10 a display means including a plurality of discrete display positions at each of which at least one symbol is to be displayed; and
- 15 a control means for controlling operation of the display of symbols in the display positions of the display means, the display positions being arranged in a matrix having m rows and n columns, where m is greater than 1 and m does not equal n to provide for m length award lines and n length award lines, a symbol occurring at one display position in the matrix being independent of, and unassociated with, the occurrence of symbols at any other display position in the matrix.

20 Preferably, the display means comprises a video simulation of spinning reels with only one position from each reel being shown at each display position. It will be appreciated that, conventional spinning reel-type games have reel strips which carry symbols thereon so that the position of one symbol is always fixed relative to its adjacent symbol on that reel strip. Accordingly, unless the context clearly indicates otherwise, it is to be understood that what is meant by "independent of, and unassociated with the occurrence of symbols at any other display position in the matrix" means that the symbol appearing at one position is not governed by symbols appearing at adjacent positions in a column on the display means.

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30 At least certain of the award lines may be in the form of paylines of a spinning reel game with the occurrence of predetermined combinations of symbols on any such payline awarding a prize.

35 Instead, or in addition, others of the award lines, when predetermined combinations of symbols occur thereon, may form a trigger condition for a particular award. The trigger condition may commence a feature of some sort. The feature may be any kind of variance from the standard game such as a series of free games, a second screen animation which results in prizes being given, the payment of bonus amounts, or the like. For example,

horizontal and criss-cross award lines may be conventional paylines with vertical award lines being trigger conditions upon occurrence of a predetermined combination of symbols. By "horizontal" is meant a payline extending parallel to the rows of the matrix while by "vertical" is meant paylines extending parallel to columns of the matrix.

5 Further, it will be appreciated that the vertical award lines may also function as conventional paylines, a paytable associated with said vertical award lines differing from a paytable associated with said horizontal and criss-cross paylines. Thus, the gaming machine effectively embodies variable
10 length paylines.

The gaming machine may include a selecting means for enabling a player to create award lines.

An award line selected by the player may pass through at least one of m display positions and n display positions. When the selected award line
15 passes through m display positions, it may pass through every position in one of the columns and, when the award line selected passes through n display positions, it may pass through only one position from each column. Instead, an award line selected by the player may have n display positions through which it passes.

20 For example, a payline may be five symbols long and the player may choose the positions on the screen through which the player wants the payline to pass. This may also be applied without player choice or intervention where, by staking more credits, positions on the screen are bought rather than lines passing through positions.

25 In a further embodiment of the invention, the symbols in predetermined positions in the matrix may determine a feature which is to be awarded. For example, if a predetermined number of symbols appear in a first column of the matrix, a free game feature may be triggered where all standard wins are repeated by the number of a second type of symbol
30 appearing in the second column. It will be appreciated that various other embodiments of this type may be incorporated in the control means of the machine.

In yet a further embodiment of the invention, each symbol, or at least certain of them, may be superimposed on a part of a pattern. Accordingly,
35 each display position may display two items of information. More particularly, the two items of information may, firstly, be the symbol and,

secondly, a part of the pattern. Then, once all the reels have been "spun-up" and the pattern is completed, this may trigger a special prize or feature. Thus, it will be appreciated that participating symbols, in effect, perform two functions, being the usual payout for combinations of symbols, if in a prize winning combination, as well as the trigger condition resulting from completion of the pattern.

5 Accordingly, a second aspect of the invention provides a gaming machine which includes:

10 a display means including a plurality of discrete display positions at each of which at least one symbol is to be displayed; and

15 a control means for controlling operation of the display of symbols in the display positions of the display means, the display positions being arranged in a matrix where a symbol occurring at one display position in the matrix is independent of, and unassociated with, the occurrence of symbols at any other display position in the matrix and each symbol is superimposed on a secondary symbol where, if the secondary symbols are arranged in a predetermined order, a special award is made.

20 The secondary symbol may be a part of a pattern and said predetermined order is that order in which the parts are so arranged as to complete the pattern.

25 The special award may be a bonus prize or a trigger condition for a feature.

The display means may comprise a video simulation of spinning reels with only one position from each reel being shown at each display position.

25 At least certain of the award lines may be in the form of paylines of a spinning reel game where occurrence of predetermined combinations of symbols on any such payline awards a prize. Other of the award lines, when predetermined combinations of symbols occur thereon, may form a trigger condition for a particular game.

30 Said at least certain of the award lines may be horizontal and criss-cross paylines and said others of the award lines may be vertical award lines. The vertical award lines may also function as paylines, a paytable associated with said vertical award lines differing from a paytable associated with said horizontal and criss-cross paylines.

35 The gaming machine may include a selecting means for enabling a player to create award lines.

An award line selected by the player may pass through at least one of m display positions and n display positions, where m is the number of rows in the matrix and n is the number of columns in the matrix. When the selected award line passes through m display positions, it may pass through every position in one of the columns and, when the award line selected passes through n display positions, it may pass through only one position from each column. Instead, an award line selected by the player may have an equal number of display positions through which it passes as there are columns in the matrix.

In a further embodiment of the invention, symbols in predetermined positions in the matrix may determine a feature which is awarded.

Brief Description of the Drawings

The invention is now described by way of example with reference to the accompanying drawings in which:

Figure 1 shows a three dimensional view of a gaming machine, in accordance with the invention;

Figure 2 shows a block diagram of a control circuit of the gaming machine;

Figure 3 shows a schematic representation of a display of the gaming machine; and

Figure 4 shows a schematic representation of a further embodiment of the display.

Detailed Description of the Drawings

In Figure 1, reference numeral 10 generally designates a gaming machine, in accordance with the invention. The machine 10 includes a console 12 having a video display unit 14. The video display unit 14 includes a screen 16. A matrix of fifteen discrete reels 18 is simulated on the screen 16. A keypad 20 is provided on the console 12. The keypad 20 comprises two or more keys for enabling a player of the machine 10 to select various options, as will be described in greater detail below. One button or key of the keypad 20 is provided for causing a spinning simulation of the reels 18 to occur upon actuation of that button.

The machine 10 includes a top box 22 on which paytables 24 are displayed.

A coin tray 26 is mounted beneath the console 12 for cash payouts from the machine 10.

As shown in Figure 2 of the drawings, a control system 30 is illustrated. A program which implements the game and user interface is run on a processor 32 of the control system 30. The processor 32 forms part of a controller 34. The controller 34 drives the screen 16 of the video display unit 14 and receives input signals from sensors 36. The sensors 36 include sensors associated with the buttons of the keypad 20 and/or touch sensors mounted in the screen 16.

The controller 34 also receives input pulses from a mechanism 38 indicating that a player has provided sufficient credit to begin playing. The mechanism 38 may be a coin input chute, a bill collector, a credit card reader, or any other type of validation device. Finally, the controller 34 drives a payout mechanism 39 which, for example, may be a coin hopper for feeding coins to the coin tray 26 to pay out a prize once a predetermined combination of symbols carried on the reels 18 appears on the screen 16.

As shown in Figure 3, in which an example of a screen 16 is shown, the reels 18 are arranged in an $m \times n$ matrix where $m = 3$ and $n = 5$. Award lines 40, being horizontal lines link the rows of reels 18 in the matrix.

Additional award lines 42, in a criss-cross pattern, link the five reels 18. The lines 40 and 42 serve as conventional paylines for the machine 10. In other words, when a predetermined combination of symbols appears on any of the paylines 40 or 42 which are active, ie. in respect of which a bet has been staked, a prize will be paid in accordance with the paytable 24.

With the provision of discrete mini reels 18, the reels 18 in the columns are also interconnected by vertical, shorter award lines 44. These lines 44 operate as trigger condition lines and, optionally, as paylines. Where the lines 44 operate as paylines, a different paytable may be applicable to that applicable in respect of the paylines 40 and 42. As an example, a combination of five kings on one of the paylines 40 or 42 may pay 500 credits, four kings may pay 50 credits and three kings may pay 15 credits whereas, on the vertical paylines 44, the combination of three kings may pay 100 credits.

Those skilled in the art will appreciate that most standard games involve winning combinations in two forms. Firstly, there are conventional prize combinations where, as described above, specific combinations pay a

prize, be it a fixed prize or a variable prize. Secondly, there are feature trigger combinations. This is where specific combinations commence a feature of some sort. It is envisaged that, in respect of the invention, the vertical lines 44 will serve as the award lines on which the trigger combinations are active. The features which are triggered could be any kind of variance from the standard game such as a series of free games, a second screen animation which results in prizes being given, bonus awards, or the like.

With the gaming machine 10 of the invention, a player may be given a choice of options as to which features will be operable. Skill may be a factor in determining whether or not a prize is awarded from the feature or the size of the prize that will be awarded from it.

The commencement of the feature may change the form of the game such that for the next predetermined number of games, for example, ten games, every time a certain symbol is spun up a bonus amount is paid. Feature trigger combinations may or may not be prize combinations in themselves and the features that they trigger also may or may not pay a prize.

Where the vertical lines 44 serve as the trigger lines, an embodiment of the invention would be for different lines 40, 42 and 44 to actually make up different games. This could apply to all lines 40, 42 and 44 but, preferably, the standard paylines 40, 42 will, as described above, have the same payable apply to them. In contrast, for each vertical line 44 that is bought by the player the game rules will change. This embodiment of the game can be implemented in various ways. For example, on the first vertical line 44 three of a symbol could buy a free game feature where all standard wins could be multiplied by the number of a different symbol appearing on the second vertical line. Instead, different symbols could be used to make up the reels that make up each vertical line. In other words, symbol A may only appear on the reel strips applicable to the three reels that make-up the first column or line 44 where symbol B may only appear on those reels in the second column or line 44. Other symbols could be common to the vertical lines 44.

Yet a further embodiment of the invention is to buy positions instead of fixed paylines. Essentially, the player will be making up their own paylines. There could be a fixed length where each payline must consist of a predetermined number of symbols, for example, five symbols or variable

payline lengths could be allowed where different rules would apply for the different lengths of lines.

Referring now to Figure 4 of the drawings, a further embodiment of the invention is illustrated. In this embodiment of the invention, each reel 18 incorporates a symbol 46 such as a king, ace or other special symbol such as symbol A, symbol B or symbol C. The symbol 46 is superimposed on a part 48 of a background pattern illustrated generally at 50. Hence, it will be appreciated that each reel 18 incorporates two different things, the symbol 46 and the part 48 of the background pattern 50. Thus, the symbols 46, in their usual way, make up winning combinations on the award lines 40, 42 and 44. When a certain pattern 50 appears a special prize or feature will be awarded to the player. The preferred embodiment is for the feature to be triggered by the occurrence of a specific pattern 50 over all fifteen of the reels. The completion of the pattern triggers the commencement of the special bonus feature regardless of whether any prize winning combinations of symbols 46 occurs.

Hence, it is an advantage of the invention that a gaming machine 10 is provided which has more versatility than other gaming machines of which the applicant is aware. In particular, dual functions can be imparted to the reels 18 to serve as parts of trigger conditions and payline combinations. Also, as in the last embodiment described above, each reel 18 carries two representations of symbols thereon to serve the dual purpose of forming payline combinations and contributing to a trigger condition.

It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive.

CLAIMS:

1. A gaming machine which includes
a display means including a plurality of discrete display positions at
each of which at least one symbol is to be displayed; and
5 a control means for controlling operation of the display of symbols in
the display positions of the display means, the display positions being
arranged in a matrix having m rows and n columns, where m is greater than 1
and m does not equal n to provide for m length award lines and n length
award lines, a symbol occurring at one display position in the matrix being
10 independent of, and unassociated with, the occurrence of symbols at any
other display position in the matrix.
2. The gaming machine of claim 1 in which the display means comprises
a video simulation of spinning reels with only one position from each reel
being shown at each display position.
- 15 3. The gaming machine of claim 2 in which at least certain of the award
lines are in the form of paylines of a spinning reel game where the
occurrence of predetermined combinations of symbols on any such payline
awards a prize.
4. The gaming machine of claim 3 in which others of the award lines,
20 when predetermined combinations of symbols occur thereon, form a trigger
condition for a particular award.
5. The gaming machine of claim 4 in which said at least certain of the
award lines are horizontal and criss-cross paylines and said others of the
award lines are vertical award lines.
- 25 6. The gaming machine of claim 5 in which said vertical award lines also
function as paylines, a paytable associated with said vertical award lines
differing from a paytable associated with said horizontal and criss-cross
paylines.
7. The gaming machine of any preceding claim which includes a
30 selecting means for enabling a player to create award lines.
8. The gaming machine of claim 7 in which an award line selected by the
player passes through at least one of m display positions and n display
positions.
9. The gaming machine of claim 8 in which, when the selected award
35 line passes through m display positions, it passes through every position in

one of the columns and, when the award line selected passes through n display positions, it passes through only one position from each column.

10. The gaming machine of claim 7 in which an award line selected by the player has n display positions through which it passes.

5 11. The gaming machine of any preceding claim in which symbols in predetermined positions in the matrix determine a feature which is awarded.

12. The gaming machine of any preceding claim in which each display position displays two items of information.

10 13. The gaming machine of claim 12 in which the two items of information are, firstly, a symbol and, secondly, a part of a pattern where, if all the parts of the pattern appear in a correct position in the matrix to make up a completed pattern, a further award is made.

14. A gaming machine which includes

15 a display means including a plurality of discrete display positions at each of which at least one symbol is to be displayed; and

a control means for controlling operation of the display of symbols in the display positions of the display means, the display positions being arranged in a matrix where a symbol occurring at one display position in the matrix is independent of, and unassociated with, the occurrence of symbols at any other display position in the matrix and each symbol is superimposed on a secondary symbol where, if the secondary symbols are arranged in a predetermined order, a special award is made.

20 15. The gaming machine of claim 14 in which the secondary symbol is a part of a pattern and said predetermined order is that order in which the parts are so arranged as to complete the pattern.

25 16. The gaming machine of claim 15 in which the special award is a bonus prize or a feature.

30 17. The gaming machine of any one of claims 14 to 16 in which the display means comprises a video simulation of spinning reels with only one position from each reel being shown at each display position.

18. The gaming machine of claim 17 in which at least certain of the award lines are in the form of paylines of a spinning reel game where occurrence of predetermined combinations of symbols on any such payline awards a prize.

35 19. The gaming machine of claim 18 in which others of the award lines, when predetermined combinations of symbols occur thereon, form a trigger condition for a particular feature.

20. The gaming machine of claim 19 in which said at least certain of the award lines are horizontal and criss-cross paylines and said others of the award lines are vertical award lines.
21. The gaming machine of claim 20 in which said vertical award lines also function as paylines, a paytable associated with said vertical award lines differing from a paytable associated with said horizontal and criss-cross paylines.
5
22. The gaming machine of any one of claims 14 to 21 inclusive which includes a selecting means for enabling a player to create award lines.
- 10 23. The gaming machine of claim 22 in which an award line selected by the player passes through at least one of m display positions and n display positions, where m is the number of rows in the matrix and n is the number of columns in the matrix.
- 15 24. The gaming machine of claim 23 in which, when the selected award line passes through m display positions, it passes through every position in one of the columns and, when the award line selected passes through n display positions, it passes through only one position from each column.
- 20 25. The gaming machine of claim 22 in which an award line selected by the player has an equal number of display positions through which it passes as there are columns in the matrix.
26. The gaming machine of any one of claims 14 to 25 inclusive in which symbols in predetermined positions in the matrix determine a feature which is awarded.

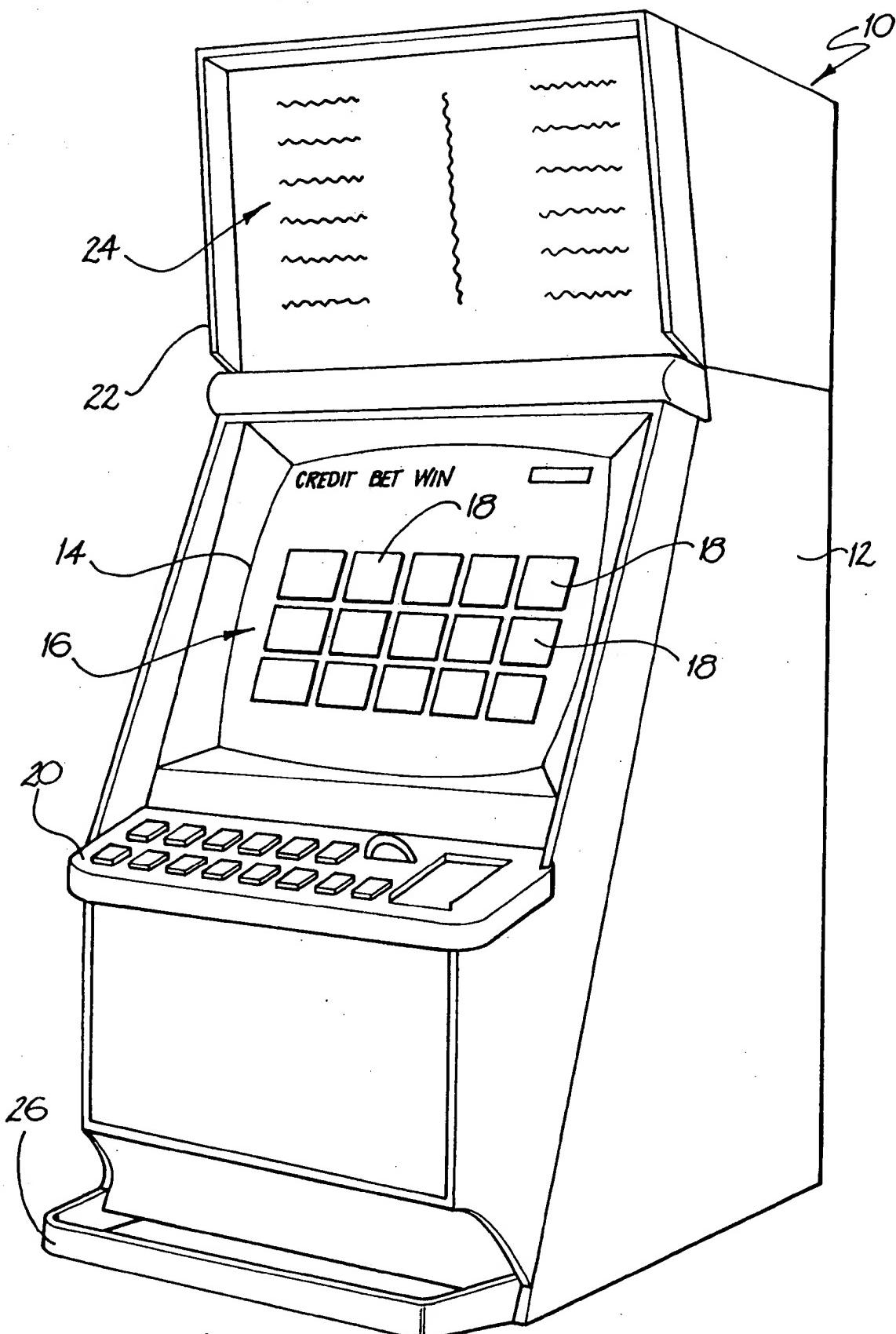


FIG. 1

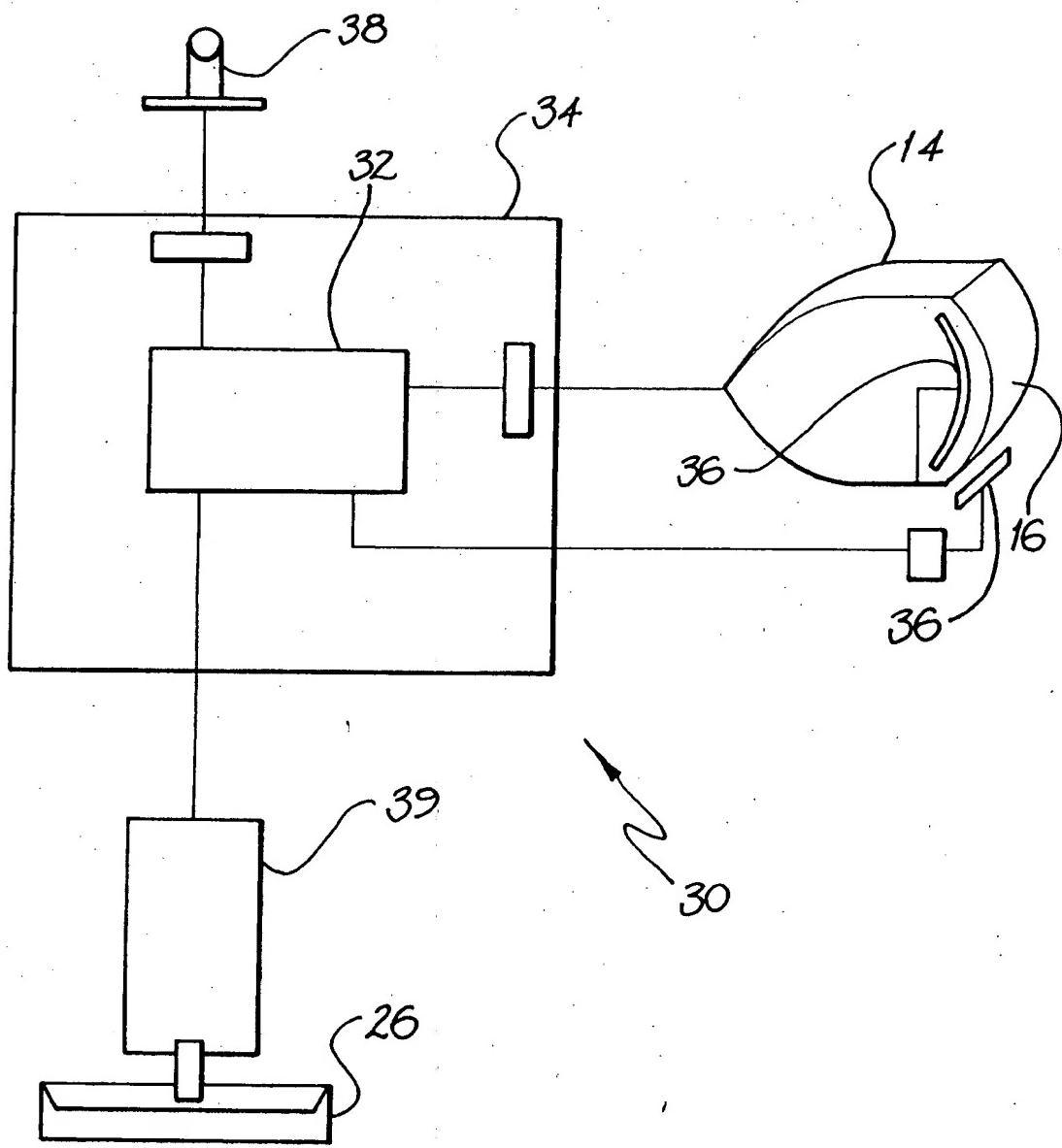


FIG. 2

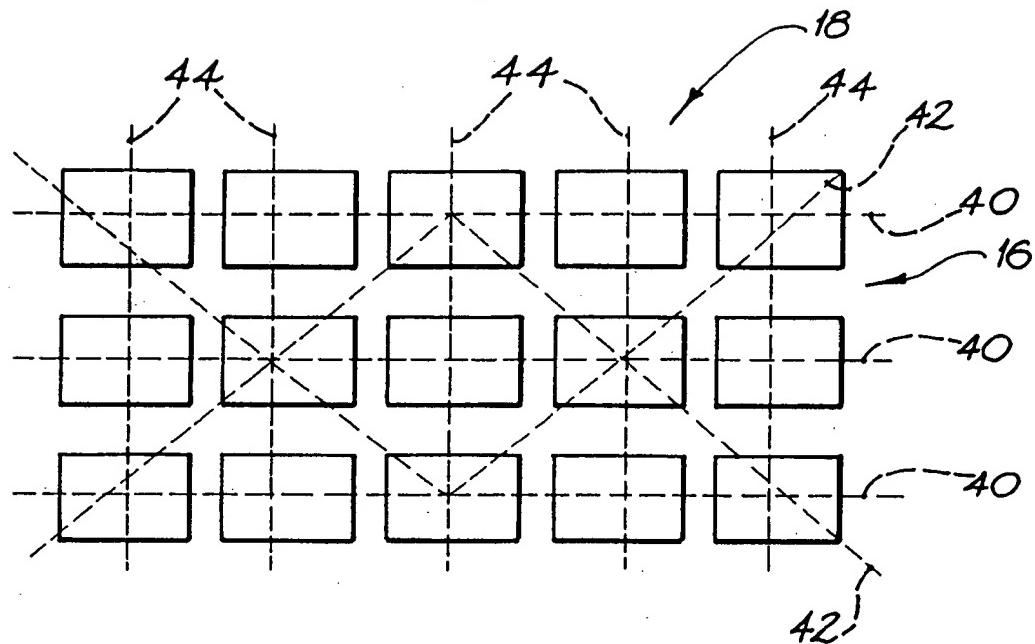


FIG. 3

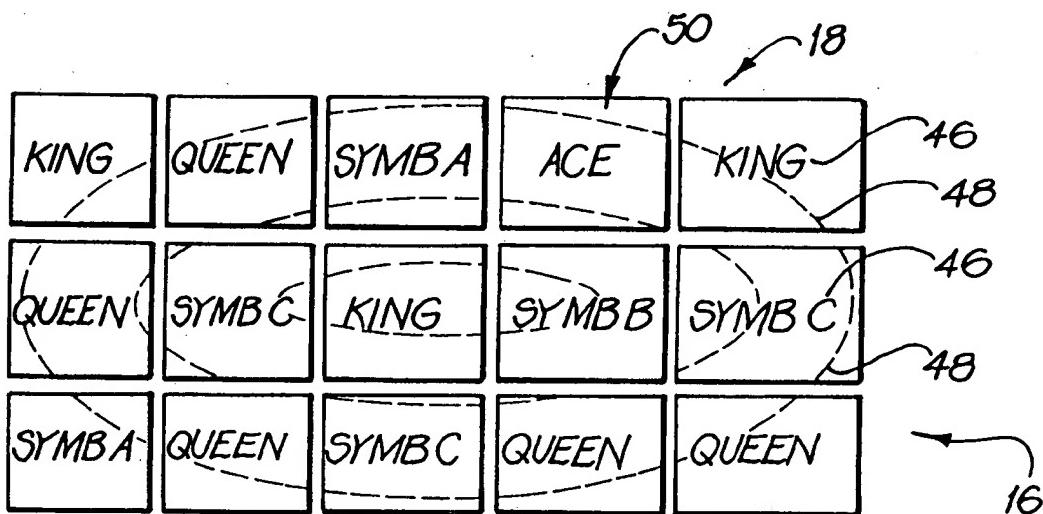


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU00/01232

A. CLASSIFICATION OF SUBJECT MATTER		
Int. Cl. : A63F 13/00, 5/04; G07F 17/34		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) IPC A63F 9/22, 13/00, 5/04; G07F 17/34		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU:IPC AS ABOVE		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WPAT, USPTO		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	AU 42504/99A, ARISTOCRAT LEISURE INDUSTRIES PTY LTD, 30 December 1999	1
X	US 5580053A, CROUCH, 3 December 1996	1-11
X	US 4838552A, HAGIWARA, 13 June 1989	1-5
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
<ul style="list-style-type: none"> * Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>		
Date of the actual completion of the international search 17 November 2000	Date of mailing of the international search report 28 NOV 2000	
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized officer S KAUL Telephone No : (02) 6283 2182	

INTERNATIONAL SEARCH REPORT

International application No. PCT/AU00/01232

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4743024A, HELM et al, 10 May 1988	1
X	WO 9608799A, ARISTOCRAT LEISURE INDUSTRIES PTY LTD, 21 March 1996	1-5
A	GB 2137392A, JPM (Automatic Machines) Ltd, 3 October 1984	
P,A	AU 43488/99A, ARISTOCRAT LEISURE INDUSTRIES PTY LTD, 2 March 2000	

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/AU00/01232

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member				
AU	42504/99	WO	9964997					
US	5580053	AU	30128/95	EP	698869			
US	4838552	AU	20082/83	GB	2130413	JP 59069092		
		JP	59088182	JP	59090584			
US	4743024	CA	1261970	GB	2183381			
WO	9608799	AU	35143/95	US	6093102			
GB	2137392	NONE						
AU	43488/99	NONE						
END OF ANNEX								